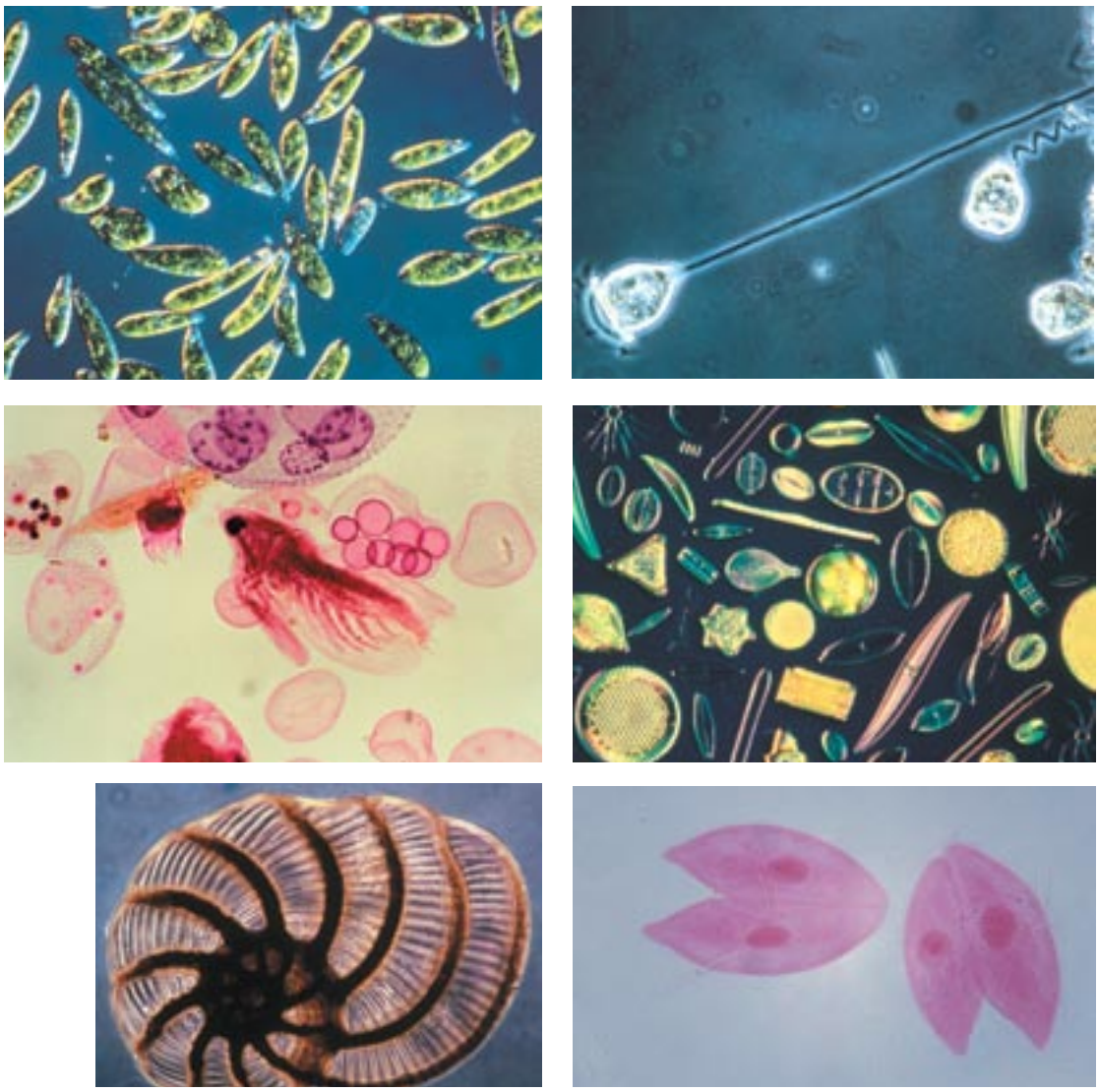
43 Microbes Under View

Study the photographs on this page. You can see microbes of different shapes, sizes, and structures. Microbes are organized into different groups based partly on differences in their cell structure. In this activity, you will look at two different groups of microbes to see what kinds of differences you can find. You will observe stained slides of **protists** (PRO-tists) and **bacteria** (bak-TEER-ee-uh).

You first saw microbes when you looked at water samples in Activity 36, "Looking for Signs of Micro-Life." Do you recognize any of the same creatures in these photographs?



Microbes display a fascinating variety of shapes, sizes, and structures.

CHALLENGE **What are some of the differences among the cells of two groups of microbes?**

MATERIALS

For the class

- **16 microscopes**
- **4 slides of *Trypanosoma* (protist)**
- **4 slides of *Amoeba* (protist)**
- **4 slides of *Paramecium* (protist)**
- **4 slides of *Bacillus* (bacteria)**
- **4 slides *Coccus* (bacteria)**

For each student

- **1 Student Sheet 35.3, "Microscopy Drawings "**
- **1 compass**

PROCEDURE

1. You and your partner should receive a microscope slide of a one-celled microbe.
2. Be sure that your microscope is set on the lowest power (shortest objective, usually 4x) before placing your slide onto the microscope stage. Center the slide so that the specimen is directly over the light.
3. Begin by observing the slide on low power. You may need to search the slide for the organisms. Be sure that an organism is in the center of the field of view (you may need to move the slide slightly) and completely in focus before going on to Step 4.

   Hint: To check that you are focused on the material that is on the slide, move the slide slightly while you look through the eyepiece—the material that you are focused on should move at the same time as you move the slide.

   Hint: On prepared slides, organisms are usually stained with dyes to make them easier to see: look for blue, purple, green, or pink organisms.

4. Without moving the slide (which can be secured with stage clips), switch to medium power (usually 10x). Adjust the microscope settings as necessary. Observe the organism.

5. Without moving the slide, switch to high power (usually 40x). *Be careful not to smash the objective against the slide!* Adjust the microscope settings as necessary.

   Hint: If material on the slide is too dark to see, increase the amount of light on the slide: do this by slightly opening the diaphragm under the stage.

6. Turn the fine focus knob up and down just a little to reveal details of the microbe at different levels of the slide.

7. Review "Microscopy Drawing Made Easy" from Activity 35, "A License to Learn." Review the rules that you developed for microscopic drawings in Activity 36, "Looking for Signs of Micro-life." Draw your organisms (on high power) on Student Sheet 35.3 "Microscopy Drawings." Label the cell structures you can identify.

8. Switch slides with another pair of students and repeat Steps 2–7.

9. Repeat Step 8 until you have seen all five microbe slides.

10. When you have completed your observations, turn off the microscope light and set the microscope back to low power.

11. Work with your group to discuss Analysis Questions 1 and 2 before the class discussion.

ANALYSIS

1. When you compare the different protists, what differences do you observe?

2. When you compare the different bacteria, what differences do you observe?

3. When you compare all of the different microbes, what similarities and differences do you observe?

4. Look at the drawings of micro-life you made for Activity 36, "Looking for Signs of Micro-Life." Could any of the organisms you saw have been protists or bacteria? Support your answer with evidence from this activity.

5. In your science notebook, create a larger version of the diagram shown below (known as a Venn diagram). Record unique features of cells of each group of organisms in the appropriate space (either "protists," "bacteria," or "human" cells). Record common features between groups in the space that overlaps.

   Hint: Think about what you have learned about cells in the last few activities. Look again at your notes from this activity.